We claim:

1. A process for the preparation of aromatic acylphosphine oxides (II), which comprises converting aromatic carboxyphosphines (I) to the acylphosphine oxides (II),

(I) (II)

in which

R^1 is C_6-C_{12}-aryl or a five- to six-membered aromatic heterocycle having oxygen, nitrogen and/or sulfur atoms, where said radicals can in each case be substituted by aryl, alkyl, aryloxy, alkyloxy, heteroatoms and/or heterocycles, and

R^2 and R^3 independently of one another are C_1-C_{18}-alkyl, C_2-C_{18}-alkyl optionally interrupted by one or more oxygen and/or sulfur atoms and/or one or more substituted or unsubstituted imino groups, C_2-C_{18}-alkenyl, C_6-C_{12}-aryl, C_5-C_{12}-cycloalkyl, C_1-C_{18}-alkoxy or a five- to six-membered heterocycle having oxygen, nitrogen and/or sulfur atoms, where said radicals can in each case be substituted by aryl, alkyl, aryloxy, alkyloxy, heteroatoms and/or heterocycles, also a metal, a group $-O^-cation^+$ or halogen.

2. A process as claimed in claim 1, which is carried out in the absence of a catalyst at a temperature above 100°C or in the presence of a catalyst above 80°C.

3. A process as claimed in claim 2, wherein 5 to 100 mol% catalyst, based on the starting material (I), are used.

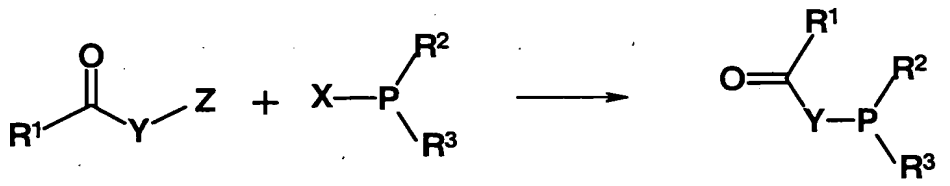
4. A process as claimed in claim 3, wherein the catalyst is chosen from the group consisting of Friedel-Crafts catalysts, Lewis acidic ionic liquids, nucleophilic catalysts, acid chlorides, acid anhydrides, alkyl halides, halogens, Arbusov catalysts, catalysts with simultaneous Lewis-acidic and Lewis-basic properties and transition metals with high affinity to phosphorus.

5. A process as claimed in any of the preceding claims, wherein R^1 is chosen from the group consistig of phenyl, tolyl, xylyl, α-naphthyl, β-naphthyl, 2-, 3- or 4-chlorophenyl, 2,6- or 2,4-dichlorophenyl, 2,4,6-trichlorophenyl, 2-, 3- or 4-methylphenyl, 2,6- or 2,4-dimethylphenyl, 2,4,6-trimethylphenyl, 2-, 3- or 4-ethylphenyl, 2,6- or 2,4-diethylphenyl, 2-, 3- or 4-isopropylphenyl, 2-, 3- or 4-tert-butylphenyl, 2-, 3- or 4-methoxyphenyl, 2,6- or 2,4-dimethoxyphenyl, 2,6- or 2,4-diethoxyphenyl, methylnaphthyl, 2,6-dimethylphenyl, 2,4,6-trimethylphenyl, 2,6-dimethoxyphenyl, 2,6-dichlorophenyl, 4-bromophenyl, 2- or 4-nitrophenyl, 2,4- or 2,6-dinitrophenyl, 4-dimethylaminophenyl, 4-acetylphenyl, 2- or 3-furyl, 2- or 3-thiophenyl, 2- or 3-pyrryl and dimethylpyrryl.

6. A process as claimed in any of the preceding claims, wherein R^2 and R^3 independently of one another are chosen from the group consisting of 2,4,4-trimethylpentyl, benzyl, p-chlorobenzyl, 2,4-dichlorobenzyl, p-methoxybenzyl, methoxy, ethoxy, n-propyloxy, isopropyloxy, n-butyloxy, isobutyloxy, sec-butyloxy, tert-butyloxy, 6-hydroxy-1,4-dioxohexyl, 9-hydroxy-1,4,7-trioxononyl, 12-hydroxy-1,4,7,10-tetraoxododecyl, 6-methoxy-1,4-dioxohexyl, 9-methoxy-1,4,7-trioxononyl, 12-methoxy-1,4,7,10-tetraoxododecyl, 6-ethoxy-1,4-dioxohexyl, 9-ethoxy-1,4,7-trioxononyl, 12-ethoxy-1,4,7,10-tetraoxododecyl, 8-hydroxy-1,5-dioxooctyl, 12-hydroxy-1,5,9-trioxooctyl, 16-hydroxy-1,5,9,13-tetraoxohexadecyl, 10-hydroxy-1,6-dioxodecyl, 15-hydroxy-1,6,11-trioxopentadecyl, vinyl, 1-propenyl, allyl, methallyl, 1,1-dimethylallyl, 2-butenyl, 2-hexenyl, 2-phenylvinyl, 2-methoxyvinyl, 2-ethoxyvinyl, 2-chlorovinyl, phenyl, tolyl, xylyl, α-naphthyl, β-naphthyl, 4-diphenylyl, 2-, 3- or 4-chlorophenyl, 2,4- or 2,6-dichlorophenyl, 2,4,6-trichlorophenyl, 2-, 3- or 4-methylphenyl, 2,4- or

2,6-dimethylphenyl, 2,4,6-trimethylphenyl, 2-, 3- or 4-ethylphenyl, 2,4- or 2,6-diethylphenyl, 2-, 3- or 4-isopropylphenyl, 2-, 3- or 4-tert-butylphenyl, 2-, 3- or 4-methoxyphenyl, 2,4- or 2,6-dimethoxyphenyl, 2-, 3- or 4-ethoxyphenyl, methylnaphthyl, chloronaphthyl, ethoxynaphthyl, 2,6-dimethylphenyl, 2,4,6-trimethylphenyl, 2,4- or 2,6-dimethoxyphenyl, 2,4- or 2,6-dichlorophenyl, 2- or 4-nitrophenyl, 2,4- or 2,6-dinitrophenyl, 4-dimethylaminophenyl, 4-acetylphenyl, 2,4,6-trimethylbenzoyl, 2,6-dimethoxybenzoyl and 2,6-dichlorobenzoyl.

7. A process for the preparation of carboxyphosphines, which comprises carrying out a conversion according to



(IV) (III)

in which

R^1, R^2 and R^3 have the meanings given in claim 1,

X is halogen, pseudohalogen, un-, mono- or disubstituted nitrogen or sulfuryloxy,

Y is oxygen, sulfur, un- or monosubstituted nitrogen and

Z is hydrogen, or an equivalent of a cation

at a temperature between 50 and 100°C.

8. A process as claimed in claim 7, wherein the reaction is carried out in the presence of an auxiliary base which, protonated as a salt, forms $R^1(CO)Y^-$ with the anionic compounds of (IV), or a salt with a melting point below 160°C with X^-.

9. A process as claimed in claim 8, wherein the auxiliary base is chosen from the group consisting of 3-chloropyridine, 4-dimethylaminopyridine, 2-ethyl-4-aminopyridine, 2-methylpyridine (α-picoline), 3-methylpyridine (β-picoline), 4-methylpyridine (γ-picoline), 2-ethylpyridine,

2-ethyl-6-methylpyridine, quinoline, isoquinoline, pyridine, 1-C_1-C_4-alkylimidazole, 1-methylimidazole, 1,2-dimethylimidazole, 1-n-butylimidazole, 1,4,5-trimethylimidazole, 1,4-dimethylimidazole, imidazole, 2-methylimidazole, 1-butyl-2-methylimidazole, 4-methylimidazole, 1-n-pentylimidazole, 1-n-hexylimidazole, 1-n-octylimidazole, 1-(2'-aminoethyl)imidazole, 2-ethyl-4-methylimidazole, 1-vinylimidazole, 2-ethylimidazole, 1-(2'-cyanoethyl)imidazole and benzotriazole.

10. The use of carboxyphosphines obtainable by a process as claimed in one of claims 7 to 8 for the preparation of acyl phosphine oxides (II) as claimed in claim 1.

11. The use of acylphosphine oxides of the formula (II) as in claim 1, obtainable as claimed in any of claims 1 to 6 as photoinitiator in radiation curing.